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This Paper is Only Skin Deep: The Socio-cultural and Biological Reality of Human Variation

Paige Jamieson
Parkland College

Paige Jamieson

Dr. Isabel Scarborough

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The debate on race suffers irresolution namely because of its ambiguous definition. What is the cultural significance of race? Does race even exist? To those aware of the dispute, this is an ever-continuing debate (Edgar et al. 1). No doubt, the concept of race is meaningful to nearly everyone and its cultural implications do clearly exist. The common and academic sense of the word 'race' is multi-faceted. Ethnicity, skin color, heritage, culture, nationality, language, and religion all fall under the different facets of race. But does race have any biological significance? On the whole – no, but that question necessitates a follow up explanation. The purpose of this paper is to provide a brief survey of how race has been examined by anthropologists as a cultural construct with biological traits. I will focus my discussion on how race is viewed in the United States, given our tendency to color-code racially-defined groups of people into explicit, permanent categories – black, white, red, yellow and brown. We all understand what is implied by these labels that are visually easy to recognize due to the phenotypical similarities in the people divided by them. However, modern genetics has amply shown that race is not a biological reality and does a poor job at describing human variation

(Edgar et al. 1). In the following paragraphs I provide a history of how these racial classifications emerged to show how "race" is a mistaken term to classify human diversity.

It is helpful in understanding the race concept to understand how these racially-oriented groups arose in the first place, acknowledging the past and how race was studied/understood within the complex environmental, cultural and biological framework that 'race' exists in today. Because of the cultural baggage that surrounds the term 'race', it is often impractical and misleading to use it directly. It simply has far too many confusing presumptions. Instead, in this paper I choose to use the term 'race concept'. This is more useful to connote the discrepancies that fall between evidence that suggests that race is inaccurate in describing human variation and the cultural idea of 'race' and "what appears to be obvious to the casual observer" – the physical differences between people and their influence on social stratification in society (Smay 21).

Despite the array of physical diversity that characterizes each person in a unique way, the human population on the whole is one of the most genetically similar of all species. One fruit fly to another has more genetic variance than say a person in China compared to a person in Brazil ("Human Diversity – Go Deeper"). Even more to the point, there does not exist a gene, trait or feature that is representative of any cultural or geographical understanding of 'race'. That is, biological divisions in the sense of racial subspecies are inaccurate. Human variation is immensely complex within our species and, therefore, it is impossible and fallacious to ascribe all people to specific racial categories for there will certainly always be an exception. However, for the sake of illustrating human variation in its most natural way, at times it is easier to use racial

classifications (noting that they are lacking or skewed) than it is to whole-heartedly investigate its complexities without this conjecture (Smay 20). This is most beneficial in understanding that human variation coincides with geographic locations; one of the most reliable ways to analyze variation in our species.

Considering racial concepts through geographic means is based on relating the people of one location against the physical characteristics and allele frequency of another population. The general idea is to classify people of certain areas by their genetic similarity through hereditary traits. Scientists are certain that the perspective that individuals of different "races" belong to different subspecies is false. However, they seem to be more up in the air on the use of a geographic approach to race. This methodology must be compensated with the concept of evolution to fully understand its subtleties by way of the natural tendency of human variation. Many racial concepts developed out of pre-evolutionary perspectives of a fixed and constant world – variation among people was of little concern. Once evolutionary theory began changing the preconceived notion that variation exists throughout the natural world, the study of the race concept also changed – with a focus directed at human variation as a continuum rather than as a classification system. It is necessary to note that the critique of the biological race concept does not discredit the reality of human variation or the idea that people of one area on the globe are going to be different than those on the other side of it. Variation is obviously real and geographically structured. The point is to fill in the misinterpreted gap that humans have created when they divided people into separate subspecies. (Relethford 335)

To some researchers, particularly forensic anthropologists who study the race concept, 'racial' differences in humans is not so much an issue of debate as it is an antecedent body of knowledge inherent in their work. "The scholarship that defines and quantifies racial characteristics and provides a kind of cookbook set of instructions for identifying them (and therefore identifying an individual's race) by definition accepts race as a valid and useful way to partition human groups" (Smay 21). This "cookbook" of typological characteristics often divides phenotypical facial features into three categories of African, Asian and European. These categories commonly typify measurements of cranial index, nasal bones and cavities, and facial profiles. These physical characteristics do often follow a pattern, which is why they are used as an indicative tool for forensic anthropologists. Although these characteristics merely occur in a greater degree of frequency, they are not absolute as there is as much variation within one of these groups as there is across the scope of all of these groups (Scarborough 2).

Despite their flaws, these 'racial' categories of physical characteristics still serve as a generally reliable apparatus in applied forensic (Smay 21). Peoples of African ancestry are said to have longer crania, wide and expanding nasal bones with rounded nasal cavities, and prognathic facial profiles, which denotes that the chin does not protrude past the teeth. Peoples of Asian descent are indicated as having shorter crania, narrow and expanding nasal bones with oval-shaped cavities and intermediate facial profiles in which the teeth and chin extend to a similar range. Those of European ancestry are described as having medium-sized crania, towering and parallel nasal bones with tear-shaped cavities, and orthognathic facial profiles which relates to the chin protruding past the teeth (Scarborough 3).

This mode of lumping complex, overlying tangents of people into clear and concise factions is reminiscent of sciences' past comprehension of human variation. Former studies tended to marginalize variation among people – instead focusing on 'types'. A type referring to overstated tendencies towards similar characteristics among specific populations. The trouble with this thinking is that if taken outside the context of the forensic anthropology laboratory and its use as a limited tool of identification, it can preoccupy academics over the number of classifications rather than objectively viewing the spectrum of variation. This misinterpretation took place in the past where the number of these classifications ranged from three to nine and kept growing. However, as with any classification on human variation, this system was disproven through exception. For example, Australian natives or aborigines have dark skin; under the three 'race' classification system they could be considered 'African'. But closer inspection shows that their traits do not necessarily correlate; their hair tends to be wavier than curly and in some cases even blonde (Relethford 339). This urged some scientists to create a new classification of 'races', deepening the incongruity of the entire system. More to the point, this technique first assumes a specific number of 'types' where the array of phenotypical differences among humans is continuous; it does not jump from one 'type' to another. Instead, human variation is a panorama, slowly diversifying from one area on the globe to the next, where 'types' are checkpoints along the way. From the lightest skin color to the darkest, there are numerous variations in between (Relethford 336-339).

In this light, the perception of the race concept when compared to actual variation in humans runs amiss. By taxonomic definition, biological 'race' is a complete fiction; it implies race as a subspecies – groups of the same species separated by distinct types. This

terminology connotes isolated populations that develop strict distinguishable characteristics from another subspecies (Relethford 335). There are no uniformly categorical assortments for humanity. There exists no gene, trait, or characteristic that specifies all members of one 'race' from all members of another ("Human Diversity – Go Deeper"). Mapping any number of traits across the entirety of humans would never correlate with cultural ideas of race. In addition, the nature of human beings and the amount of time that we have survived on this planet naturally deters us from evolving into subspecies.

Critical criteria in creating subspecies are isolation and time. In the scope of our evolution, *Homo sapiens sapiens* is a young species emerging around 150,000-200,000 years ago in Eastern Africa. From there, we only began to migrate out of Africa 100,000-150,000 years before present. As we moved to different areas on the globe, we began to adapt slight physical differences based on our environment. Mobility seems to constitute much of what makes humans human; our populating every inhabitable corner of this Earth is something that is remarkably unique to us and has been since very early in our evolutionary inception. Unlike other animals limited to designated environments, habitat and geographical features seem to play only an obstacle for us to overcome. Therefore, our mobility, along with much cultural and genetic mingling, prevents groups from becoming genetically distinct and isolated from the rest of our species. In fact, beneath our skin, we are one of the most genetically similar of all species. Penguins, for example, have twice the amount of genetic diversity among them than humans. Fruit flies have ten times as much. What might seem to be a broad array of diversity between various people

is truly skin deep, correlating with very miniscule genetic differences ("Human Diversity – Go Deeper").

This understanding of diversity begs the question – how did we become so physically diverse? Much of people's emphatic sensitivity to human variation falls on skin color primarily because it's the most prominent difference among humans – correlating often with other traits - and, more generally, with sociocultural structures. Some might assume that the difference in skin pigmentation is associated with strong genetic variants. However anthropologist Nina Jablonski has postulated that it simply coincides with how well one can assimilate certain vitamins (Kirchweger, "The Biology of Skin Color"). The anthropological study of human skin pigmentation has gone through drastic changes over the past hundred, even fifty years. Some reading this might be familiar with the notion that lighter skin is more resistant to cold weather – a concept which stems from a pattern of generally lighter skin as we move away from the equator. However, as always, exemptions arise that have scholars questioning what is at the root of these differences. For example, in the Arctic regions, "groups like the Inuit are both dark and particularly resistant to cold" (Kirchweger, "The Biology of Skin Color").

Early hominin ancestors to humans likely had fewer sweat glands, similar to the anatomy of chimpanzees, our closest living evolutionary relative. These early humans had to cope with the greater sun exposure they were introduced to in savanna regions, as well as work harder salvaging for food. Mammalian brains are particularly susceptible to overheating; "A change of only five or six degrees can cause a heatstroke" (Kirchweger, "The Biology of Skin Color"). Our biology needed a better way of cooling off and evolution found its answer through sweat. Natural selection eventually favored these

human ancestors with more sweat glands because they could survive longer in the direct sun and heat, having more opportunities to come across food sources and raise healthy offspring. Ultimately about a million years of evolution lead to modern humans with around two million sweat glands covering the surface of our bodies and a lack of much of the hair that was once present. These hairless humans (in comparison to our chimpanzee-like ancestors) could stand the heat because they were quicker to dry without hair trapping in the fluid; the sweat particles evaporating off the skin released more bodily heat. However, this evolutionary path had repercussions - our exposed skin made us prone to damage from ultraviolet radiation (Kirchweger, “The Biology of Skin Color”).

Much debate went on in anthropological circles as to the exact damaging factor that sunlight caused, leaving our bodies to produce greater amounts of melanin (skin pigmentation) to compensate. Skin cancer was the first assumed culprit. However, cancer usually develops later in life, after the reproductive years end. Jablonski then came across a 1978 study on folate, a vitamin B complex, and the effect ultraviolent radiation can have on this complex within humans. It showed how an hour in intense sunlight could cut folate levels in half in those with fairer skin. Low folate levels in pregnant mothers and their offspring are correlated with neural-tube defects in infants, in which they are born with incomplete brains and/or spinal cords. So the theory became that darker skin evolved to compensate for lost levels of folate in places where ultraviolet radiation was higher. For this theory to hold, one would assume that darker skin color would correspond with higher levels of UV radiation; which is exactly the case (Kirchweger, “The Biology of Skin Color”).

Since we evolved out of Eastern Africa – out of areas with high levels of ultraviolet radiation – this implies that darker skin evolved first. So why do we see light skin too? Under the folate theory, darker skin would protect against loss in folate just as much as in climates with less UV radiation. Simply because humans encountered less ultraviolet radiation does not necessitate evolving a completely new trait. The answer is found in our bodies' need for another vitamin. Vitamin D depends on ultraviolet radiation for production in the body. Scientists believe humans developed lighter skin in northern areas where sunlight is weakest in order to assimilate significant amounts of vitamin D. This vitamin is essential for calcium absorption – especially in fast-growing embryos. Pregnant women's need for vitamin D might also explain why women have lighter skin than men throughout the world (Kirchweger, "The Biology of Skin Color").

With all this complexity aside, human biological variation comes down to our geographic relationship with each other, not to genetic dissonance. The anthropological consensus states that race is a myth – a cultural construct – not a biological reality. Although, some figures in the anthropological world argue that the race concept becomes much more complex when cultural factors are added the majority, based on the science around the race concept, also agree that our biology is homogenous. We are a less variable species than our closest relative in the animal kingdom, but some heterogeneous variance exists – otherwise we would not see variation among people. More to the point, Gravlee postulates that under certain cultural constrictions, 'race becomes biology', contending that as important as the genetic evidence is, it reduces the intricacy of organisms' interplay with causal external or environmental factors. Gravlee summarizes this situation as follows:

> "Epidemiologic evidence shows that, in a very certain sense, race is biology. There are, in fact, well-defined differences between racially defined groups for a range of biological outcomes – cardiovascular disease, diabetes, renal failure, cancer, stroke, and birth outcomes, to name a few. In the face of this evidence, the refrain that race is not biology is impotent at best, counterproductive at worst. The challenge is to move beyond the past assertion that race is not biology to explain how race becomes biology" (Gravlee 51).

The gravity of the "no-race" argument of the race concept is the insinuation that with no biological races of humankind then there are no discussions to be had on the subject. Instead, Gravlee supports the view that race as a cultural construct should be a 'starting-point' for further research towards its health-related implications rather than an excuse to dismiss the concept of race altogether. Simply because race does not carry as much biological weight as it does cultural, does not diminish it biologically and culturally (Gravlee 53-54).

In the nineteenth and early twentieth century, anthropologists focused on classifying different races to apply a framework to human variations. Since then, the anthropological community has recognized how the natural tendency of human variation suffers under this view, rejecting race as biology. The challenge is now to bring together the little known fact that we are one of the least genetic variable species on this planet and amend our cultural proclivity toward instituting 'racially' defined sociocultural limitations that affect us not only culturally, but also biologically. The not so simple debate over whether race is biologically 'real' or not and its implications has been broached and challenged anew many times by those well aware of the controversy. This

paper has served to review how race has been examined by anthropologists as a cultural phenomenon with biological aspects. Very few of the untrained public will accept the scientific bases of race as biological myth when they see ‘evidence’ of such in the faces of those around them every day. Repairing these discrepancies between biological reality and cultural assumption takes time until a middle ground can become the status quo. This is a necessary task that anthropology can continue to contribute to.

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